Measurement of light mesons at RHIC by PHENIX experiment

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Light mesons are considered to be an important tool for understanding the properties of the quark-gluon plasma formed in ultra-relativistic heavy ion collisions. The suppression of light mesons at high transverse momentum, compared to expectations from scaled p+p results, reflects the properties of the strongly interacting matter formed. The unique combination of the short lifetime of ρ, ω and ϕ, comparable to that of the fireball, and their leptonic decay unaffected by further rescattering, allow to probe this new state of matter and may shed light on the restoration of chiral symmetry in the transition from normal nuclear matter to the quark-gluon plasma. Precise knowledge of light meson yields and their ratios as a function of transverse momentum and in different collision systems constitute a means to investigate the dependence of hadron formation on particle mass and quark-flavor composition, and the mechanism of jet production and quenching.

The PHENIX experiment at RHIC has performed a set of measurements of light mesons (π^0, K^0_S, η, ω, η', ϕ) via multiple decay channels over a wide range of transfer momentum. This talk presents recent results on the production rates of light mesons and their nuclear modification factors in p+p, d+Au, Cu+Cu and Au+Au collisions at different energies.

[1] FIRST REFERENCE

[2] SECOND REFERENCE

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